MONTH 12

The Ultimate Math Mania Challenge

Investigate, Solve, Create & Share

Month 12 is the culminating Math Mania experience. Students bring together the number sense, patterns, logic, geometry, probability, coordinates, estimation, and strategic thinking developed throughout the program.

Nine original puzzle stations produce nine numerical answers. When those answers are converted into letters, they reveal a final secret message. The month ends with students designing, testing, and sharing a mathematical puzzle of their own.

A TRUE CULMINATING EXPERIENCE

The goal is not speed alone. Students should collaborate, explain their reasoning, compare strategies, and recognize how much their mathematical thinking has grown.

By the End of This Month, Students Should Be Able To:

- Select appropriate strategies for unfamiliar problems.
- Connect ideas from several areas of mathematics.
- Explain and defend a solution clearly.
- Check answers using conditions, estimation, or a second method.
- Collaborate productively during a multi-stage challenge.
- Create an original, solvable mathematical puzzle.

Skills Revisited

- Patterns and sequences
- Number properties and arithmetic
- Counting and combinations
- Geometry and coordinates
- Probability and logical reasoning
- Mathematical communication

Suggested Format

- Place the nine station pages around the room.
- Students work individually or in small teams.
- Allow approximately 4-6 minutes per station.
- Teams record each numerical answer on the code sheet.
- Finish with the creation challenge and class showcase.

The Final Reveal

Each station answer is between 1 and 26. Students convert the answers using 1 = A, 2 = B, 3 = C, and so on. The nine letters reveal the name of the program and complete the curriculum.

FINAL CHALLENGE

Crack the Math Mania Code

Nine puzzles. Nine numbers. One secret message.

Directions

- Solve each of the nine puzzle stations.
- Record one numerical answer from each station in the table below.
- Convert each answer to a letter using 1 = A through 26 = Z.
- Keep your work organized so your team can explain every answer.
- When all nine letters are complete, read the secret message.

LETTER CODE

1=A 2=B 3=C 4=D 5=E 6=F 7=G 8=H 9=I 10=J 11=K 12=L 13=M
14=N 15=O 16=P 17=Q 18=R 19=S 20=T 21=U 22=V 23=W 24=X 25=Y 26=Z

Answer & Letter Record

PUZZLE	NUMBER	LETTER
1		
2		
3		
4		
5		
6		
7		
8		
9		

SECRET MESSAGE: _____

PUZZLE 1

Sequence Search

Solve carefully and record the requested number.

THE CHALLENGE

Find the missing number in the sequence.



Find the missing term and explain the rule connecting the sequence.

HINT

Each number is connected to the two numbers before it.

Show Your Reasoning

PUZZLE 1 ANSWER: _____

PUZZLE 2

Mystery Number

Solve carefully and record the requested number.

THE CHALLENGE

Determine the number described by all three clues.

1. I am a positive whole number.
2. Multiplying any number by me does not change that number.
3. I have exactly one positive factor, and I am less than 5.

HINT

Test the positive whole numbers smaller than 5.

Show Your Reasoning

PUZZLE 2 ANSWER: _____

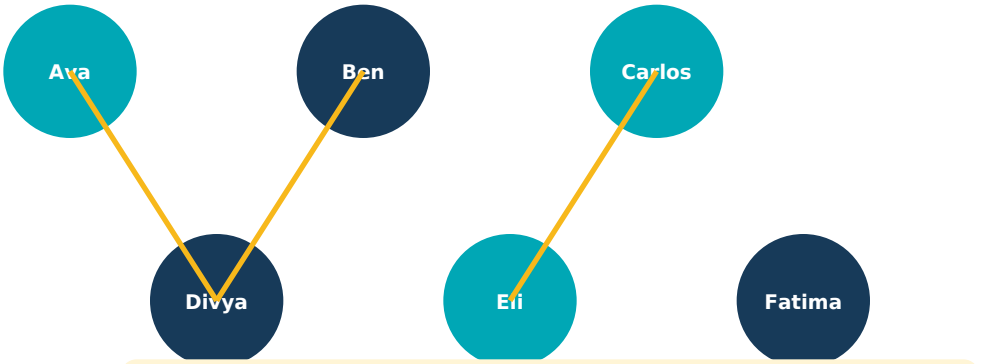
PUZZLE 3

Team Combinations

Solve carefully and record the requested number.

THE CHALLENGE

Six students want to form a three-person puzzle team.



Choose 3 of the 6 students

Order does not create a new team.

HINT

Build an organized list, or choose the first student and count systematically.

Show Your Reasoning

PUZZLE 3 ANSWER: _____

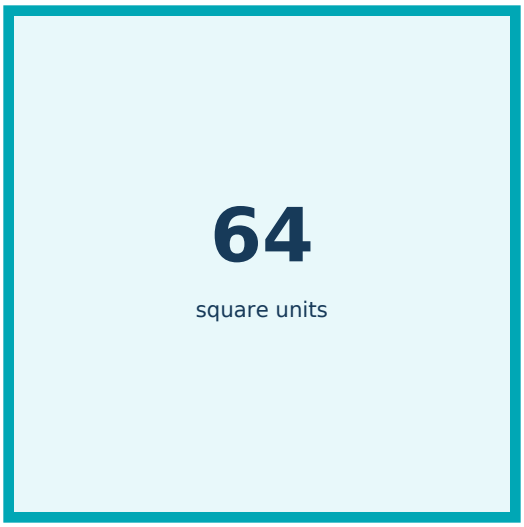
PUZZLE 4

Geometry Challenge

Solve carefully and record the requested number.

THE CHALLENGE

A square has an area of 64 square units. Find one side length.



side length = ?

HINT

The area of a square is side x side. Extension: find the perimeter.

Show Your Reasoning

PUZZLE 4 ANSWER: _____

PUZZLE 5

Number Detective

Solve carefully and record the requested number.

THE CHALLENGE

Find the only number that satisfies every clue.

1. It is greater than 10 but less than 20.
2. It is odd.
3. It is prime.
4. The sum of its digits is 4.

HINT

List 11 through 19, then eliminate numbers that fail each clue.

Show Your Reasoning

PUZZLE 5 ANSWER: _____

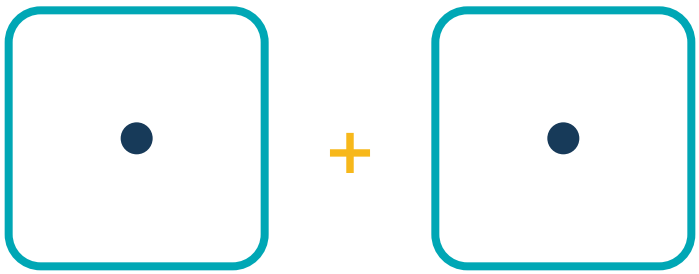
PUZZLE 6

Probability Challenge

Solve carefully and record the requested number.

THE CHALLENGE

Two ordinary six-sided dice are rolled. Find the probability that their sum is 2.



How many outcomes produce a total of 2?

HINT

List the ordered pairs that produce 2. Record only the numerator of the probability.

Show Your Reasoning

PUZZLE 6 ANSWER: _____

PUZZLE 7

Make the Target

Solve carefully and record the requested number.

THE CHALLENGE

Use 2, 3, 4, and 5 exactly once to create an expression equal to 14.



TARGET = 14

Use each number exactly once.

HINT

Try the simplest operation before creating a complicated expression.

Show Your Reasoning

PUZZLE 7 ANSWER: _____

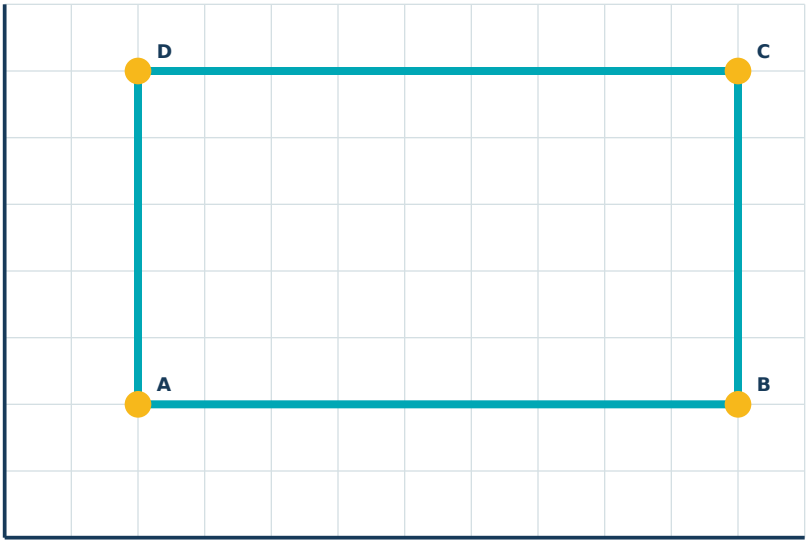
PUZZLE 8

Coordinate Mission

Solve carefully and record the requested number.

THE CHALLENGE

Plot A=(2,2), B=(11,2), C=(11,7), and D=(2,7), then connect A-B-C-D-A.



Record the horizontal distance AB for the secret code.

HINT

For a horizontal segment, subtract the x-coordinates.

Show Your Reasoning

PUZZLE 8 ANSWER: _____

PUZZLE 9

Magic Square Finale

Solve carefully and record the requested number.

THE CHALLENGE

Complete the magic square. What number belongs in the blank?

8		6
3	5	7
4	9	2

Every row, column, and diagonal must total 15.

HINT

Use the top row: 8 + ___ + 6 = 15.

Show Your Reasoning

PUZZLE 9 ANSWER: _____

CREATE & SHARE

Design Your Own Math Puzzle

Your team is now the puzzle-writing team.

Create an original mathematical puzzle for another team to solve. Your puzzle should be challenging enough to require thought, but clear enough that another group can determine a definite answer.

Your Puzzle Must:

- Use at least two mathematical skills.
- Have clear and complete directions.
- Have a definite solution that your team has checked.
- Include one helpful hint.
- Include a written explanation of the solution.
- Offer an easier or harder variation.

Possible Combinations

- Geometry + patterns
- Probability + strategy
- Coordinates + logic
- Arithmetic + magic squares
- Sequences + algebra
- Estimation + number sense

Puzzle Title _____

Directions and Challenge

Helpful Hint

Answer _____

INSTRUCTOR SECTION

Puzzle Solutions: 1-6

Keep this section separate from student station pages.

1. Sequence Search - 13

Each term is the sum of the previous two. Therefore 5 + 8 = 13.

2. Mystery Number - 1

One leaves every number unchanged when multiplying, and it has exactly one positive factor.

3. Team Combinations - 20

There are 6 choose 3 = (6 x 5 x 4) / (3 x 2 x 1) = 20 different teams.

4. Geometry Challenge - 8

The side length is the square root of 64, so it is 8 units. The extension perimeter is 32 units.

5. Number Detective - 13

Thirteen is between 10 and 20, odd, prime, and its digits add to 4.

6. Probability Challenge - 1

Only the outcome (1,1) has a sum of 2. The probability is 1/36, so the recorded numerator is 1.

INSTRUCTOR SECTION

Puzzle Solutions: 7-9

The completed code reveals the program name.

7. Make the Target - 14

The simplest solution is 2 + 3 + 4 + 5 = 14.

8. Coordinate Mission - 9

The points form a rectangle. AB is 9 units, BC is 5 units, and the area is 45 square units.

9. Magic Square Finale - 1

The top row must total 15, so 8 + 1 + 6 = 15. The blank is 1.

FINAL CODE

13 1 20 8 13 1 14 9 1

Convert each number using 1 = A, 2 = B, ... 26 = Z

M A T H M A N I A

Final Discussion Prompts

- Which problem required the most persistence?
- Which strategy from an earlier month helped your team?
- Did anyone solve a puzzle in a different way?
- How has your response to difficult problems changed?
- What kind of mathematics would you like to explore next?